

# Application Guide Overview

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**muRata**

*Innovator in Electronics*



# Automotive

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Category	Series/Type	Functions/Applications
Capacitors	GCM LLC	Decoupling/coupling, tuning
EMI Filters	NF BLM DLW	EMI noise suppression (signal/power lines)
Inductors/Coils	LQG LQW	Matching
Trimmer Potentiometers	PV	ETC, parking assistance, back warning system
Ceramic Resonators	CSTC	CAN-BUS
Microwave Components	MM LFB	ETC
Position Sensors	SV	Climate control, AFS, car navigation
Angular Rate Sensors	MEV	Car navigation, PND
Ultrasonic Sensors	MA	Parking assistance
Thermistors	NCP PRF NXFS	Temperature sensing
Buzzers	PKM PKL	Warning/reminder sound
Modules	LBMA LBEX / RZ	Wireless connectivity / ETC
Low Temperature Co-fired Ceramics	LTCC	General purpose motor management
Hybrid Crystal	XRCGB	High-speed CANBUS, FlexRay™
DC-DC Converters – low power	HBO NMG MER NPH NDW NDY NDTD	Traffic control, avionics
DC-DC Converters – mid to high power	BEI UEI UEI15 UWE UQQ TWR	Subway communications
AC-DC Power Supplies	MVAB	Electric vehicles, railway signaling
Shock Sensors	PKGS	Wakeup function for TPMS

Note: Click on any series/type for more information.

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## RKE (Remote Keyless Entry)

Category	Series/Type	Functions/Applications
Chip Capacitors	GCM	Coupling/Decoupling and tuning
Trimmer Capacitors	TZ	Antenna matching
Inductors/Coils	LQG LQW LQP	Matching
Trimmer Potentiometers	PV	RF circuits
Ceramic Resonators	CSAC CSTC	Clock generator
Ceramic Filters	SFE	IF Filter
Electrical Double-Layer Capacitors - <small>high power density</small>	DME	Peak current battery assist



## Data Processing

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Category	Series/Type	Functions/Applications
Capacitors	GRM RPE DE	Coupling/Decoupling and tuning
Electrical Double-Layer Capacitors - <small>high power density</small>	DME DMD	Audio peak assist, data back-up system
Polymer Aluminum Electrolytic Capacitors	ECAS	Smoothing/Transient backup
Trimmer Capacitors	TZ	Trims for accurate capacitance
EMI Filters	NF BLM DL	EMI noise Suppression (signal/power lines)
Inductors/Coils	LQM LQH	Choke, SW regulators
Trimmer Potentiometers	PV	Trims for accurate resistance
Ceramic Resonators	CSAC CSTC	Clock generator
Thermistors	PTF NXFT	Temperature compensation, overcurrent protection
Piezo Sounders/Buzzers/Ringers	PKB PKL PKM	Gives audible signal when voltage applied
Hybrid Crystal	XRCGB	USB 2.0/3.0, Ethernet
Microblowers	MZB	Spot cooling
DC-DC Converters - <small>low power</small>	MTU NKE NMG MER NMK MEV	Networking equipment
DC-DC Converters - <small>mid to high power</small>	VR111 OKAMI VR110	Peripherals, servers
AC-DC Power Supplies	D1U-W D1U-4CS D1U-H	Network testing, storage devices

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## Electronics Displays



Category	Series/Type	Functions/Applications
Chip Capacitors	GRM GNM	Coupling/Decoupling
Electrical Double-Layer Capacitors - <small>high power density</small>	DME	Peak current battery assist and audio peak assist
Polymer Aluminum Electrolytic Capacitors	ECAS	Smoothing/Transient backup
EMI Filters	NF BLM DL	EMI noise suppression (signal/power lines)
Inductors/Coils	LQM LQH	Chokes, SW regulators
Trimmer Potentiometers	PV	LCD module, flicker adjustment
Ceramic Resonators	CSAC CSTC	Clock generator
Thermistors	NCP NTS PTF	Current protection/temperature compensation/temperature measurement/black line regulator
ESD Devices	LXES	ESD Suppression

## Electronic POS

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Category	Series/Type	Functions/Applications
Chip Capacitors	GRM	Coupling/Decoupling
Electrical Double-Layer Capacitors - <small>high power density</small>	DME	Peak current battery assist
Polymer Aluminum Electrolytic Capacitors	ECAS	Smoothing/Transient backup
EMI Filters	NF BLM DL	EMI noise Suppression (signal/power lines)
Trimmer Potentiometers	PV	Trims for accurate resistance
Ceramic Resonators	CSAC CSTC	Clock generator
Chip Antennas	ANC LDA	Antenna for communication
Thermistors	NCP NTS PTF	Temperature compensation/temperature measurement
Piezo Sounders/Buzzers/Ringers	PKB PKL PKM	Gives audible signal when voltage applied
ESD Devices	LXES	ESD Suppression
Modules	LBMA LBWA LBEE LBEH	Handheld POS Communication
μDCDC Converters	LXDC	DC to DC Converter (from lithium ion battery)
DC-DC Converters - <small>low power</small>	MTU NKE NME NMA NPH NDY NTA NDS6	Printers, desktop PCs
DC-DC Converters - <small>mid to high power</small>	BEI UEI UEI15 UWE UCQ	Copiers, fax machines
AC-DC Power Supplies	MVAB	Scanners, portable equipment

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## PBX Equipment

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Category	Series/Type	Functions/Applications
Chip Capacitors	<b>GRM</b>	Coupling/Decoupling and tuning
Electrical Double-Layer Capacitors - <small>high power density</small>	<b>DME DMD</b>	Data back-up system
Polymer Aluminum Electrolytic Capacitors	<b>ECAS</b>	Smoothing/Transient backup
Safety Capacitors	<b>DE</b>	Capacitors for high voltage
EMI Filters	<b>NF BLM DL</b>	EMI noise Suppression (signal/power lines)
Ferrite Cores	<b>FS</b>	To suppress EMI noise on tip/ring
Ceramic Resonators	<b>CSAC CSTC</b>	Clock generator
Piezo Sounders/Buzzers/Ringers	<b>PKB PKL PKM</b>	Gives audible signal when voltage applied

## Set Top Box (STB)

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Category	Series/Type	Functions/Applications
Chip Capacitors	GRM LLL GNM	Coupling/Decoupling and tuning
Chip Capacitors	GRM GA	High voltage and safety
Electrical Double-Layer Capacitors - <small>high power density</small>	DME DMD	Audio peak assist, data back-up system
Polymer Aluminum Electrolytic Capacitors	ECAS	Smoothing/Transient backup
High Value Capacitors <small>for Tantalum Replacement</small>	GRM	Coupling/Decoupling and tuning
EMI Filters	NF BLM DL	EMI noise Suppression (signal/power lines)
Common Mode Choke Coils <small>for AC Circuit</small>	PLA10 PLH10 PLY PLT10	EMI Suppression
Inductors/Coils	LQM LQH	Chokes, SW regulators
Trimmer Potentiometers	PV	Trim resistance
Ceramic Resonators	CST CSTC	Clock Function
Hybrid Crystal Resonators	XRCGB	USB 2.0/3.0, timing device for controllers
SAW Filters	SAF	RF Filter/Interstage Filter
Active Filters	AF	Special filter for modems
Thermistors	NCP PTGL	Temperature compensation/temperature measurement/inrush current protection
Inrush NTC Thermistors	NTP	Current Limiting
ESD Devices	LXES	ESD Suppression
Modules	LBWA LBEE LBEH	Remote control, AV streaming
μDCDC Converters	LXDC	DC to DC Converter (from lithium ion battery)
Microwave Components	LFB	Chip Multilayer LC Filters
Chip Antennas	ANC LDA	Antenna for communication

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## USB

Category	Series/Type	Functions/Applications
Chip Capacitors	<b>GRM</b>	High voltage and safety, Coupling/Decoupling and tuning
Polymer Aluminum Electrolytic Capacitors	<b>ECAS</b>	Smoothing/Peak power assistance
EMI Filters	<b>BLM DL</b>	EMI noise Suppression (signal/power lines)
Ceramic Resonators	<b>CSTCE-XK CSTCZ-X CSTCZ-X</b>	Clock
Hybrid Crystal Resonators	<b>XRCGB</b>	Clock
ESD Devices	<b>LXES</b>	ESD suppression
Electrical Double-Layer Capacitors - <small>high power density</small>	<b>DME</b>	Peak current battery assist

## RFID/NFC

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Category	Series/Type	Functions/Applications
Chip Capacitors	GRM	Coupling/Decoupling and tuning
Trimmer Capacitors	TZ	Antenna matching
Ferrite Cores	FS	EMI Suppression
Inductors/Coils	LQG LQW LQP	Matching
Coaxial Connectors	MM	Measurement/Testing connector
Chip Multilayer LC Filters	LFB	Filtering
Dielectric Filters	DFC DFY	Signal filter
Chip Multilayer Hybrid Dividers	LDD	Signal Dividing
Chip Multilayer Hybrid Couplers	LDC	Signal Coupling
ESD Devices	LXES	ESD Suppression
Electrical Double-Layer Capacitors - <small>high power density</small>	DME	Peak current battery assist
MAGICSTRAP®	LXMS31	PCB tagging, antennaless tag
Hybrid Crystal Resonators	XRCGB	Clock for NFC IC
Chip Antennas	ANC	Antenna for communication

# Wireless Communications

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Category	Series/Type	Functions/Applications
Chip Capacitors	GRM GJM GQM ERB MA	Coupling/Decoupling/tuning & matching
Electrical Double-Layer Capacitors - <small>high power density</small>	DME	Peak current battery assist and audio peak assist
Polymer Aluminum Electrolytic Capacitors	ECAS	Smoothing/Transient backup
Trimmer Capacitors	TZ	Frequency adjustment, antenna matching
EMI Filters	NF BLM DL	EMI Noise Suppression (signal/power lines)
Inductors/Coils	LQW LQP LQG	Matching
Trimmer Potentiometers	PV	Power adjustment, Trims for accurate resistance
Multilayer Components	LFB LFD LDB	Ceramic Based RF Filters, Diplexers, Baluns
SAW Filters	SAF	Signal Filter
Chip Antennas	ANC LDA	Antenna for communication
Thermistors	NCP PRF PRG	Temperature sensing, overcurrent protection
ESD Devices	LXES	ESD Suppression
Modules	LBMA LBEK LBWA LBEE LBEH LBEL LBGA	Hands-free, localization, internet access, wireless connectivity
μDCDC Converters	LXDC	DC to DC Converter (from lithium ion battery)
Coaxial Connectors	MM	Measurement/Testing connector

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# Industrial Automation

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Category	Series/Type	Functions/Applications
Chip Capacitors	GRM	Coupling/Decoupling and tuning
Electrical Double-Layer Capacitors - <small>high power density</small>	DME DMD	Data back-up system
Polymer Aluminum Electrolytic Capacitors	ECAS	Smoothing/Transient backup
EMI Filters	BLM NF PL BNX	EMI noise Suppression (signal/power lines)
Infrared Sensors	IRS	Human detection (PIR) automatic switch
Infrared Sensors	IRS	Energy Saving; Lightning systems
Magnetic Sensors	BS05	Banknote reader (verification; sorting)
Ultrasonic Sensors	MAHF	Double feeding
Thermistors	NCP NXFS PRF PRG PTGL	Temperature sensing, overcurrent protection
Modules	LBMA LBWA LBEE LBEH SN	POS, wireless for maintenance devices
Microblowers	MZB	Aircon sensor, air chamber cleanup
DC-DC Converters - <small>low power</small>	PWR NKE NTA NTV NMK NMV NML	Lighting, signage
DC-DC Converters - <small>mid to high power</small>	BEI UEI UWE OKAMI UQQ TWR	Robotics, automation
AC-DC Power Supplies	MVAB D1U-W C1U-W	Engine controls, elevators
Ceramic Resonators	CST CSTC	Clock Function
Hybrid Crystal Resonators	XRCGB	Clock Function
Piezo Sounders/Buzzers/Ringers	PKB PKL PKM	Audible signal
MEMS Accelerometer & Gyro	SCA SCC	Acceleration and rotation sensing

Note: Click on any series/type for more information.

## Home Automation

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Category	Series/Type	Functions/Applications
Capacitors	GRM RPE	Coupling/Decoupling and tuning
Electrical Double-Layer Capacitors - <small>high power density</small>	DME DMD	Data back-up system
Polymer Aluminum Electrolytic Capacitors	ECAS	Smoothing/Transient backup
Safety Capacitors	GR GA DEA DES KY KX	Safety
EMI Filters	NF BLM DL	EMI noise Suppression
Trimmer Potentiometers	PV TZ	AGC (Auto Gain Control)
Ceramic Resonators	CST CSTC	Clock Function
Multilayer Filters	LF	Filters for Communication Equipment
Chip Antennas	ANC LDA	Antenna for communication
Coaxial Connectors	MM	Measurement/Testing connector
Ultrasonic & Passive Infrared Sensors	IRA IRS	Human & motion detection, occupancy recognition
Thermistors	PRF NCP NXFT	Temperature measurement
Modules	LBWA LBBA SN	Energy Management, remote programming
Microblowers	MZB	Air dispenser, sensor
Piezo Sounders/Buzzers/Ringers	PKB PKL PKM	Audible tone

## Power Supplies

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Category	Series/Type	Functions/Applications
Chip Capacitors	GRM	Coupling/Decoupling and tuning
Polymer Aluminum Electrolytic Capacitors	ECAS	Smoothing/Transient backup
Leaded Capacitors	RPE	Coupling/Decoupling and tuning
Leaded Disc Capacitors	DE KY KH KX	Safety
EMI Filters	PLA PLY PLH	EMI noise Suppression (AC power lines)
EMI Filters	PLT BNX BLO	Noise Suppression
Trimmer Potentiometers	PV	Trims for accurate resistance
Inrush NTC Thermistors	NTP	Current Limiting
Thermistors	NCP NXFT PRF PTF	Temperature sensing

## DC-DC Converters

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Capacitors	GRM RPE	Coupling/Decoupling and tuning
Electrical Double-Layer Capacitors - <small>high power density</small>	DME DMD	Peak current battery assist
Polymer Aluminum Electrolytic Capacitors	ECAS	Smoothing/Transient backup
High Value Capacitors <small>for Tantalum Replacement</small>	GRM	Coupling/Decoupling and tuning
EMI Filters	BLM NFM	EMI noise suppression (power lines)
Inductors/Coils	LQM LQH	SW regulators
Common Mode Choke Coils <small>for AC Circuit</small>	PLA10 PLH10 PLY PLT10	EMI suppression
Trimmer Potentiometers	PV	Trims for accurate resistance
Inrush NTC Thermistors	NTP	Current limiting
Thermistors	NCP NXFT PRF PTF	Temperature sensing
μDCDC Converters	LXDC	DC to DC Converter (from lithium ion battery)

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## Security & Safety

Category	Series/Type	Functions/Applications
Capacitors	GRM RPE	Coupling/Decoupling and tuning
Polymer Aluminum Electrolytic Capacitors	ECAS	Smoothing/Transient backup
EMI Filters	NF BLM DL	EMI noise suppression (signal/power lines)
Inductors/Coils	LQW LQP LQG	Matching
Trimmer Potentiometers	PV	Trims for accurate resistance
Ceramic Resonators	CST CSTC	Clock Function
Chip Antennas	ANC LDA	Antenna for communication
Shock Sensors	PKGS	Detect acceleration (Shock)
Ultrasonic & Passive Infrared Sensors	MA IRA IRS	Human & motion detection, occupancy recognition
Thermistors	PTF NTS	Temperature compensation
Modules	LBWA	IP cameras
Piezo Sounders/Buzzers/Ringers	PKB PKL PKM	Audible warning tone
MEMS Accelerometer & Gyro	SCA SCC	Tampering detection

Note: Click on any series/type for more information.

## Lighting Ballast

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Category	Series/Type	Functions/Applications
Capacitors	GRM RPE DE	Snubber/Resonance
Electrical Double-Layer Capacitors - <small>high power density</small>	DME	Peak current battery assist
Leaded Disc Capacitors	DE KY KH KX	Safety
High Value Capacitors <small>for Tantalum Replacement</small>	GR	Coupling/Decoupling and tuning
EMI Filters	PLA PLY PLH	EMI noise Suppression (AC power lines)
Thermistors	PTF	Temperature compensation/Inrush current

## LED Lighting

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Category	Series/Type	Functions/Applications
Capacitors	GRM RPE	Snubber/Resonance
Electrical Double-Layer Capacitors - <small>high power density</small>	DME	Peak current battery assist
Polymer Aluminum Electrolytic Capacitors	ECAS	Smoothing
Safety Capacitors	GR GA DEA DES KY KX	Safety
Trimmer Potentiometers	PV	AGC (Auto Gain Control)
Chip Antennas	ANC LDA	Antenna for communication
Ultrasonic & Passive Infrared Sensors	IRA IRS	Human detection for automatic switch
Thermistors	PRF NCP NXFT	Over heat detection for LED device
ESD Devices	LXES	ESD Suppression
Modules	LBBA SN	Remote control

## New Energy

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Category	Series/Type	Functions/Applications
Capacitors	GR RPE	Coupling/Decoupling and tuning
Electrical Double-Layer Capacitors - high power density	DME DMD	Starter circuit, battery-free solution
Electrical Double-Layer Capacitors - high power density	DME	Data back-up system
Polymer Aluminum Electrolytic Capacitors	ECAS	Smoothing/Peak power assistance
Safety Capacitors	GR GA DEA DES KY KX	Safety
Trimmer Potentiometers	PV TZ	Kinds of compensation for precision
Ceramic Resonators	CST CSTC	Clock Function
Multilayer Filters	LF	Ceramic Base RF Filters
Coaxial Connectors	MM	Measurement/Testing connector
Chip Antennas	ANCG LDA	Antenna for communication
Thermistors	PRF NCP NXFT	Over heat detection / Temperature measurement
Modules	LBBA SN	Maintenance, Localization, environment measurements

# Measurement

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Electrical Double-Layer Capacitors - <small>high power density</small>	DME	Peak current battery assist
Polymer Aluminum Electrolytic Capacitors	ECAS	Smoothing/Peak power assistance
EMI Filters	BLM NF DLW	EMI noise Suppression (signal/power lines)
Inductors/Coils	LQH LQM	Tuning, Choke, SW regulators
Trimmer Potentiometers	PV	Trims for accurate resistance
Ceramic Resonators	CST CSTC	Clock Generator
Coaxial Connectors	MM	Measurement/Testing connector
AMR Sensors	AS	Rotational detection
Modules	LBBA SN	Remote reading, energy management
Microblowers	MZB	Air chamber cleanup
Piezo Sounders/Buzzers/Ringers	PKB PKL PKM	Audible indicator
MEMS Accelerometer & Gyro	SCA SCC	Inclination and movement measurement
DC-DC Converters - <small>low power</small>	MTU NKE NME NMA NMV NMK MEV NCS6	Calibration, gaming
DC-DC Converters - <small>mid to high power</small>	BEI UEI UEI15 OKAMI UEI30 TWR	Flow & thermal control
AC-DC Power Supplies	MVAB D1U-W D1U-4CS C1U-W	Instrumentation, thermography

Note: Click on any series/type for more information.

# Healthcare Equipment

- 01 Automotive
- 02 RKE
- 03 Data Processing
- 04 Electronics Displays
- 05 Electronic POS
- 06 PBX Equipment
- 07 Set Top Box (STB)
- 08 USB
- 09 RFID
- 10 Wireless Communication
- 11 Industrial Automation
- 12 Home Automation
- 13 Power Supplies
- 14 DC-DC Converters
- 15 Security & Safety
- 16 Lighting Ballast
- 17 LED Lighting
- 18 New Energy
- 19 Measurement
- 20 Healthcare Equipment**
- 21 White Goods

Category	Series/Type	Functions/Applications
Capacitors	<b>GRM</b>	Coupling/Decoupling
Electrical Double-Layer Capacitors - <small>high power density</small>	<b>DME</b>	Peak current battery assist
Polymer Aluminum Electrolytic Capacitors	<b>ECAS</b>	Smoothing/Transient backup
Trimmer Capacitors	<b>TZ</b>	Trims for accurate capacitance
Trimmer Potentiometers	<b>PV</b>	Trims for accurate resistance
Chip Antennas	<b>ANC LDA</b>	Antenna for communication
Piezo Sounders/Buzzers/Ringers	<b>PKB PKL PKM</b>	Gives audible signal when voltage applied
ESD Devices	<b>LXES</b>	ESD Suppression
Modules	<b>LBMA LBWA LBEX</b>	Wireless Connectivity
μDCDC Converters	<b>LXDC</b>	DC to DC Converter (from lithium ion battery)
DC-DC Converters – <small>low power</small>	<b>HBO PWR NMJ NMS</b>	Traffic control, avionics
DC-DC Converters – <small>mid to high power</small>	<b>BEI UEI UEI15 UWE UQQ TWR</b>	Subway communications
Ceramic Resonators	<b>CST CSTC</b>	Clock Function
MEMS Accelerometer & Gyro	<b>SCA SCC</b>	Inclination and movement measurement
Hybrid Crystal Resonators	<b>XRCGB</b>	Clock Function

Note: Click on any series/type for more information.

## White Goods

- 01 Automotive
- 02 RKE
- 03 Data Processing
- 04 Electronics Displays
- 05 Electronic POS
- 06 PBX Equipment
- 07 Set Top Box (STB)
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- 10 Wireless Communication
- 11 Industrial Automation
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- 17 LED Lighting
- 18 New Energy
- 19 Measurement
- 20 Healthcare Equipment
- 21 White Goods**

Category	Series/Type	Functions/Applications
Capacitors	GRM RPE	Coupling/Decoupling and tuning
Electrical Double-Layer Capacitors - <small>high power density</small>	DME DMD	Data back-up system
Polymer Aluminum Electrolytic Capacitors	ECAS	Smoothing/Transient backup
Safety Capacitors	GR GA DEA DES KY KX	Safety
Trimmer Potentiometers	PVG3	Kinds of compensation for precision
Ceramic Resonators	CST CSTC	Clock Function
Chip Antennas	ANC LDA	Antenna for communication
Coaxial Connectors	MM	Measurement/Testing connector
Thermistors	PRF NCP NXFT	Temperature measurement
Buzzers	PKB PKL PKM	Confirmation sound
ESD Devices	LXES	ESD Suppression
Modules	LBWA LBBA SN	Internet connection, energy management, remote programming
Microblowers	MZB	Air dispenser, airflow sensor

Note: Click on any series/type for more information.

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